UNITED STATES PATENT AND TRADEMARK OFFICE

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10/667,757	09/22/2003	Udayan Rajendra Kanade	COT-003	1371

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William L, Botjer
PO Box 478
Center Moriches, NY 11934

EXAMINER
KAWSAR, ABDULLAH AL

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>11/29/2007</u>.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1,5,7-16 and 19-21</u> is/are pending in the application.

     4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1, 5, 7-16, 19-21</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>09/22/2003</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

     a)☐ All   b)☐ Some * c)☐ None of:

       1.☐ Certified copies of the priority documents have been received.

       2.☐ Certified copies of the priority documents have been received in Application No. _____.

       3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

     * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

1.   Claims 1, 5, 7-16, 19-21 are pending.

Priority

2.   Applicant's claim for the benefit of a prior-filed application under 35 U.S.C. 119(e) or

under 35 U.S.C. 120, 121, or 365(c) is acknowledged. However the provisional priority for the

application has not been granted because the applicant has not complied with one or more

conditions for receiving the benefit of an earlier filing date under 35 U.S.C. 119(e) as follows:

the subject matter in provisional application 60474381 filed on 05/30/2003 does not support the

subject matter in the application 10/667757 filed on 9/22/2003. Therefore the effective filing

date for this application is 09/22/2003.

Claim Objections

3.   Claims 5, 7, 8, 9, 20 are objected to because of the following informalities:

        i.   Line 1 in claim 5(b), remove repeated "the" after allocating.

        ii.   Line 3 in claim 5(b), remove "," at the end of the line.

        iii.   Line 2 in claim 5(c), replace "processers" with "processors".

        iv.   Line 9 in claim 7, remove one "," after programs.

        v.   Line 2 in claim 8(b), remove "," at the end of the line.

        vi.   Line 1, in claim 9(b), replace "the" with "an" before enough.

        vii.   Line 1, in claim 20, remove "the" at the end of line after control.

        Appropriate correction is required.

4.   Claim 15 is objected to under 37 CFR 1.75(c), as being of improper dependent form for

failing to further limit the subject matter of a previous claim. Applicant is required to cancel the

claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the

claim(s) in independent form. It is unclear if claim 15 is a method claim or program product

claim. Appropriate correction required.

Claim Rejections - 35 USC § 112

5.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the
> subject matter which the applicant regards as his invention.

6.   Claims 1, 5, 7-15, 19-21 are rejected under 35 U.S.C. 112, second paragraph, as being

indefinite for failing to particularly point out and distinctly claim the subject matter which

applicant regards as the invention.

   a.   The following claim languages are not clearly understood and indefinite:

        i.   Claim 1, line 29 recites "request to relinquish" it is unclear what is meant

        by that(i.e. release a completed thread after execution to be able to execute

        another thread?). Line 31 it is unclear what is meant by "releasing" and "from the

        requesting thread" (i.e. release a requesting thread when it completes execution?).

        ii.   Claim 5, lines 6-9 it is unclear which request program resource is asking

        for (i.e. specific processor or specific local program?). Line 10 recites "allocating"

        it is unclear how it is allocated (i.e. when the specific processor is free or anytime

        to any other processor?). Line 13 recites "loading the requested program" it is

unclear why the program is being loaded again, it is already loaded on the

processor from step a.

iii.   Claim 8 has similar deficiencies as of claim 5 above.

iv.   Claim 7, line 23 recite "allocating" it is unclear how allocation is done (i.e.

waiting in a wait list until the processor is free?).

v.   Claim 19, lines 4 recite "creating a data structure" it is unclear what is

meat by data structure (i.e. an IDfield checking for ID match?).

Claim Rejections - 35 USC § 103

7.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

8.   Claims 1, 5, 7-16, 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Gipp (Gipp) US Patent Publication No. 2005/0044547, in view of McDonald(McDonald) US

Patent No. 7159216.

9.   As per claim 1, Gipp teaches the invention substantially as claimed including a method

for managing allocation of processors in a non- symmetric multiprocessor system for fulfilling at

least one request of one or more threads of an application program, the application program

comprising a plurality of interacting threads, the multiprocessor system comprising one or more

of general-purpose processors and one or more of special-purpose processors, each of the

special-purpose processors having access to a corresponding local program store, the corresponding local program store being loaded with one or more specific programs, the method comprising the steps of (par. 0006, lines 1-4; par. 0005, lines 2-16; par 0024, lines 3-20):

        a. receiving an allocation request from the at least one thread for at least one of the one or more special purpose processors with the corresponding local program store having at least one of the one or more specific programs, wherein the at least one of the one or more specific programs is a requested program and the at least one thread is a requesting thread (par. 0049; par. 0050, lines 8-10);

        b. granting control of the at least one of the one or more special-purpose processors to the requesting thread (par. 0054);

        c. receiving a request for executing the requested program on the at least one of the one or more special-purpose processors from the requesting thread (par. 0023, lines 2-5; par. 0049, lines 2-4; par. 0054, lines 1-2);

        Gipp does not explicitly disclose running the requested program on the at least one of the one or more special- purpose processors (par. 0054);

10.   It would have been obvious to one of the ordinary skill in the art at the time of the invention to execute the program in one of the requested special purpose processor since the processor resource is allocated to the thread to be able to execute on the specific processor.

Gipp does not specifically disclose e. receiving a request to relinquish control of the at

least one of the one or more special-purpose processors from the requesting thread; and

f. releasing the at least one of the one or more special-purpose processors from the

requesting thread.

However McDonald teaches e. receiving a request to relinquish control of the at least one

of the one or more special-purpose processors from the requesting thread (col 10, lines 10-11;

lines 33-43); and

f. releasing the at least one of the one or more special-purpose processors from the

requesting thread (col 12, lines 63-67).

11.   It would have been obvious to a person of ordinary skill in art at the time of invention

was made to incorporate the teaching of McDonald into the method of Gipp to release control to

one or more requesting thread. The modification would have been obvious because one of the

ordinary skills of the art would request a processor to release a completed thread for a requesting

thread as it is waiting to be executed to be able to utilize idle system resource and increase

performance.

12.   As per claim 5, Gipp teaches the step of granting control of the at least one of the one or

more special-purpose processors comprises the steps of:

a. searching for the at least one of the one or more special-purpose processors with the

requested program already loaded on the corresponding local program store, wherein the at least

one of the one or more special-purpose processors is free (par. 003, lines 12-14; par. 005, lines 14-16; par. 0053);

      b. allocating the at least one of the one or more special-purpose processors to the requesting thread (par. 0054, lines 1-2); and

      c. loading the requested program on the corresponding local program store of at least one of the one or more other special-purpose processers and allocating the at least one of the one or more other special-purpose processors to the requesting thread, wherein the one or more other special-purpose processors are free(par. 0049; par. 0053; par. 0054).

13.   As per claim 7, Gipp teaches the invention substantially as claimed including a method for allocating one or more special-purpose processors in a multiprocessor computer system running an application program, the application program comprising one or more threads, each of the one or more special-purpose processors having access to a corresponding local program store, the corresponding local program stores comprising one or more specific programs, at least one thread of the one or more threads requesting access to at least one specific program of the one or more specific programs, , the method comprising the steps of(par. 0006, lines 1-4; par. 0005, lines 2-16; par 0024, lines 3-20):

      a. receiving an allocation request from a requesting thread for at least one of the one or more special-purpose processors wherein the requesting thread being the at least one thread of the one or more threads and a requested program being the at least one specific program of the one or more specific programs (par. 0049; par. 0050, lines 8-10);

c. allocating the at least one of the one or more special-purpose processors to the requesting thread in the request-queue; when the at least one of the one or more special-purpose processors is free (par. 0049; par. 0053; par. 0054);

b. stalling the requesting thread (par. 0059);

Gipp dose not explicitly disclose adding the requesting thread to a request- queue when the one or more special-purpose processors are not available;

e. relinquishing the control of the at least one of the one or more special-purpose processors from the requesting thread when the at least one of the one or more special-purpose processors becomes idle.

However McDonald teaches adding the requesting thread to a request- queue when the one or more special-purpose processors are not available (col 10, lines 44-47);

e. relinquishing the control of the at least one of the one or more special-purpose processors from the requesting thread when the at least one of the one or more special-purpose processors becomes idle (col 15, lines 9-14).

14.   It would have been obvious to a person of ordinary skill in art at the time of invention was made to incorporate the teaching of McDonald into the method of Gipp to have a waiting queue for waiting application and become available to a waiting thread when the processor is idle. The modification would have been obvious because one of the ordinary skills of the art would have implemented a queue to be able to store the thread waiting to be executed for better

system performance and being able to execute the thread in order as soon the resource becomes available.

Gipp does not explicitly disclose running the requested program on the at least one of the one or more special- purpose processors (par. 0054);

15.   It would have been obvious to one of the ordinary skill in the art at the time of the invention to execute the program in one of the requested special purpose processor since the processor resource is allocated to the thread to be able to execute on the specific processor.

16.   As per claim 8, it has similar limitations as of claim 5 above. Therefore, it is rejected under the same rational as of claims 5 above.

17.   As per claim 15, Gipp teaches one or more of the steps is embodied in a computer program product (par. 0020).

18.   As per claim 16, Gipp teaches the invention substantially as claimed including a system for managing allocation of processors in a non- symmetric multiprocessor environment, the non-symmetric multiprocessor environment comprising one or more general-purpose processors and one or more special-purpose processors, each of the one or more special-purpose processors having access to a corresponding local program store, the system comprising of (par. 0006, lines 1-4; par. 0005, lines 2-16; par 0024, lines 3-20):

b. a processor allocation service for scheduling and synchronizing the plurality of threads

on one or more general-purpose processors and one or more special-purpose processors (par.

0005, lines 2-16; par 0024, lines 3-20); and

c. a local program store managing service for managing the corresponding local program

stores of each of the one or more special-purpose processors (par. 0003, lines 12-14; par. 0005,

lines 14-16; par. 0053).

Gipp does not specifically disclose a compilation service for compiling an application

program in response to a request for execution of the application program, the application

program comprising a plurality of threads.

However McDonald teaches a. a compilation service for compiling an application

program in response to a request for execution of the application program, the application

program comprising a plurality of threads (col 3, lines 3-43).

19.   It would have been obvious to a person of ordinary skill in art at the time of invention

was made to incorporate the teaching of McDonald into the method of Gipp to have a

compilation service when an application program request for execution. The modification would

have been obvious because one of the ordinary skills of the art to have a compilation service for

any program that needs to be executed to be able to execute on the CPU.

20.   As per claim 19, Gipp teaches the step of granting control of the at least one of the one or

more special-purpose processors having the requested program in the local program store to the

requesting thread comprises creating a data structure containing information for identifying the at least one of the one or more special-purpose processors and the corresponding local program store having the requested program (par. 0054; par. 0055).

21.   As per claim 20, Gipp teaches the step of granting control the of the at least one of the one or more special-purpose processors further comprises blocking the requesting thread, (par. 0049; par. 0053; par. 0054; par. 0059).

Gipp does not specifically disclose the requesting thread being added to a request queue wherein one or more special-purpose processors is not available to complete the allocation request.

However McDonald teaches the requesting thread being added to a request queue wherein one or more special-purpose processors is not available to complete the allocation request(col 10, lines 33-43).

Allowable Subject Matter

22.   Claim 9-14, 21 are objected to as being dependent upon a rejected base claim but would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Response to Amendment

23.   Applicant's arguments in respect to claims have been considered but are moot in view of
the new ground(s) of rejection.

Conclusion

24.   The prior art made of record and not relied upon is considered pertinent to applicant's
disclosure.

   Bahr et al(US Patent No. 5109512); Rogers et al (US Patent No. 6970990)

25.   Applicant's amendment necessitated the new ground(s) of rejection presented in this
office action. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of
time policy as set forth in 37 CFR 1.136(a).

26.   A shortened statutory period for reply to this final action is set to expire THREE
MONTHS from the mailing date of this action. In the event a first reply is filed within TWO
MONTHS of the mailing date of this final action and the advisory action is not mailed until after
the end of the THREE-MONTH shortened statutory period, then the shortened statutory period
will expire on the date the advisory action is mailed, and any extension fee pursuant to 37
CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,
however, will the statutory period for reply expire later than SIX MONTHS from the mailing
date of this final action.

27.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Abdullah-Al Kawsar whose telephone number is 571-270-3169.

The examiner can normally be reached on 7:30am to 5:00pm, EST.

28.   If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Meng Ai T. An can be reached on 571-272-3756. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

29.   Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would

like assistance from a USPTO Customer Service Representative or access to the automated

information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Abdullah Kawsar
Patent Examiner
Art Unit 2195.

/Meng-Ai An/
Supervisory Patent Examiner, Art Unit 2195